

# PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2001-036155

(43)Date of publication of application : 09.02.2001

(51)Int.Cl.

H01L 39/22

H01P 1/18

H01P 1/19

H01P 1/215

(21)Application number : 11-206646

(71)Applicant : JAPAN SCIENCE & TECHNOLOGY CORP

(22)Date of filing : 21.07.1999

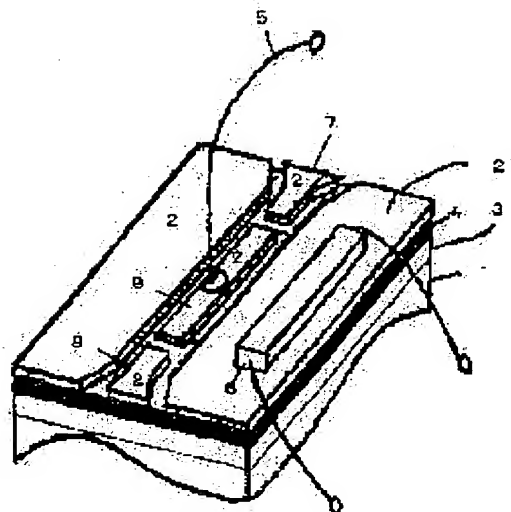
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## (54) ELECTROMAGNETIC WAVE ELEMENT

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To prevent deterioration of the device efficiency of an electromagnetic wave element by substantially changing the resonance frequency and propagating speed of the element, without changing the characteristic impedance of the element, by successively laminating a superconducting thin film, a ferroelectric thin film, and a ferromagnetic thin film or the superconducting thin film and thin film, having both ferroelectric and ferromagnetic properties on a dielectric substrate.

**SOLUTION:** A superconducting electromagnetic wave element is constituted of a dielectric substrate 1 and a low-loss line, composed of a superconducting thin film 2, a ferromagnetic thin film 3, and a ferroelectric thin film 4 which are laminated successively upon the substrate 1. A thin film having both ferroelectric and ferromagnetic properties may also be used, instead of the thin films 3 and 4. The electromagnetic wave element is also provided with an electrode 5 for changing the permittivity of the ferroelectric thin film 4 or the thin film, having both ferroelectric and ferromagnetic properties, and a magnetic field generator 6 for changing the magnetic permeability of the ferromagnetic thin film 3 or the thin film, having both ferroelectric and ferromagnetic properties.



## LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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